

Abstract of the Disclosure

After a gray scale image extracting unit converts an input document image to a gray scale image, a multi-code image binary-coding unit converts the image to a binary image having a value in which each pixel indicates either a background area or a plotting area in the image, and outputs the binary image to a binary image recognizing unit. In the multi-code binary-coding unit, a partial area extracting unit extracts one or more partial areas in the gray scale image. A partial image binary-coding unit executes a binary-coding process for each of the partial areas in the gray scale image. A binary image combining unit combines one or more partial binary images and constitutes a binary image of the entire gray scale image.